Volunteer Lake Assessment Program Individual Lake Reports
PLEASANT LAKE, NEW LONDON, NH

MORPHOMETRIC DATA

						TROPHIC CLASSIFICATION		**KNOWN EXOTIC SPECIES**
Watershed Area (Ac.):	7,488	Max. Depth (m):	28.6	Flushing Rate (yr¹)	0.7	Year	Trophic class	
Surface Area (Ac.):	606	Mean Depth (m):	10.5	P Retention Coef:	0.6	1979	OLIGOTROPHIC	
Shore Length (m):	7,200	Volume (m³):	25,761,000	Elevation (ft):	805	1993	OLIGOTROPHIC	

The Waterbody Report Card tables are generated from the DRAFT 2014 305(b) report on the status of N.H. waters, and are based on data collected from 2004-2013. Detailed waterbody assessment and report card information can be found at www.des.nh.gov/organizations/divisions/water/wmb/swqa/index.htm

Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator and the chlorophyll a indicator is okay.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Oxygen, Dissolved	Bad	There are >10% of samples (minimum of 2), exceeding criteria with one or more samples considered large exceedance.
	Dissolved oxygen satura	Slightly Bad	There are >10% of samples (minimum of 2), exceeding criteria.
	Chlorophyll-a	Good	The calculated median is from 5 or more samples and is < indicator and > 1/2 indicator.
Primary Contact Recreation	Escherichia coli	No Data	No data for this parameter.
	Chlorophyll-a	Very Good	There are a total of at least 10 samples with 0 exceedances of indicator.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

PLEASANT LAKE - ELKINS BEACH	Escherichia coli	Very Good	Where there are no geometric means, all bacteria samples are < 75% of the geometric mean. Where there are geometric means all single bacteria samples are < the SSMC and all geometric means are < geometric mean criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.
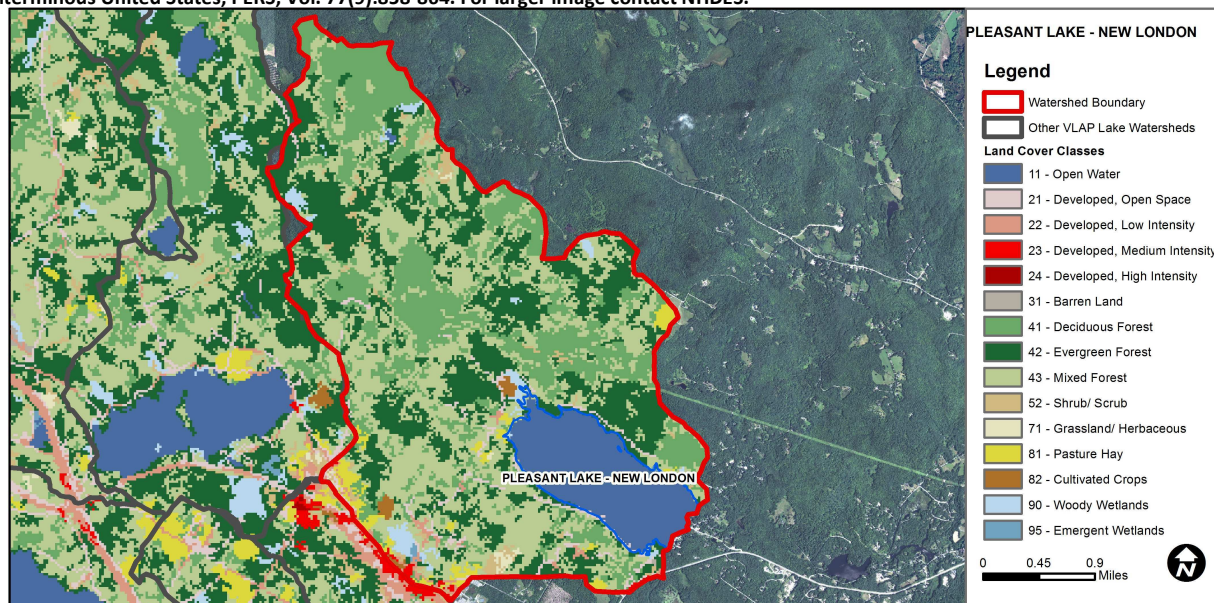
| Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	9.6	Barren Land	0.02	Grassland/Herbaceous	0.29
Developed-Open Space	1.79	Deciduous Forest	22.5	Pasture Hay	1.91
Developed-Low Intensity	0.76	Evergreen Forest	26.98	Cultivated Crops	0.42
Developed-Medium Intensity	0.34	Mixed Forest	32.34	Woody Wetlands	1.49
Developed-High Intensity	0	Shrub-Scrub	1.5	Emergent Wetlands	0.09

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
PLEASANT LAKE, NEW LONDON
2014 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics*)

- **CHLOROPHYLL-A:** Chlorophyll levels were slightly above average, decreased to low levels in July and August, and then increased in September. Average chlorophyll levels increased in 2014 and remained less than the state median. Historical trend analysis indicates highly variable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Deep spot conductivity levels were low and stable throughout the summer. Historical trend analysis indicates stable epilimnetic (upper water layer) conductivity since monitoring began. Outlet, White Bk., Turtle Cove, PL 5A, and PL 7 conductivity levels were low to average. Chandler Bk. and PL 8 conductivity levels were higher in April following spring snowmelt and then decreased to average levels. Conductivity levels in White Bk. station 4B and 4C were low in May and then increased to elevated levels on subsequent sampling events. Conductivity levels in Red Bk. stations 7A, 7C and 7D were elevated on each sampling event.
- **E. COLI:** Turtle Cove and PL 7 E. coli levels were very low and much less than state standard for surface waters.
- **TOTAL PHOSPHORUS:** Deep spot phosphorus levels remained stable and low on each sampling event. Historical trend analysis indicates relatively stable epilimnetic phosphorus since monitoring began. Chandler Bk., Outlet, White Bk. Stns. PL 4, PL 4A, and PL 4B, Turtle Cove, PL 5A, and PL 8 phosphorus levels were low. PL 4C (White Bk.) phosphorus levels were elevated in May and Oct. following storm events and the downstream PL 4B samples were not elevated. PL 7C (Red Bk.) phosphorus levels were elevated in May and Aug. following significant storm events, and then decreased to average levels in Sept. and Oct.. PL 7D (Red Bk.) phosphorus levels were elevated in May and slightly elevated in October. Downstream PL 7 phosphorus levels were low on each sampling event.
- **TRANSPARENCY:** Transparency was slightly below average for the lake in June and July, and decreased (worsened) in August following above average rainfall for the month. Transparency increased (improved) in September, however historical trend analysis indicates significantly decreasing (worsening) transparency since monitoring began.
- **TURBIDITY:** Epilimnetic turbidity was elevated in August following above average rainfall for the month. Outlet, Turtle Cove, and PL 5A turbidities were low. White Brook downstream (PL 4) turbidities were low however PL 4A was slightly elevated in April, PL 4B and 4C were slightly elevated in May, and PL 4C was elevated in Oct.. Red Bk. downstream (PL 7) turbidities were low however PL 7A was slightly elevated in April, and PL 7C and 7D were elevated in May. PL 8 turbidity was elevated in April.
- **PH:** Epilimnetic pH was within the desirable range 6.5-8.0 units however Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) pH levels were less than desirable. Historical trend analysis indicates highly variable Epilimnetic pH since monitoring began. Tributary pH levels were generally within the desirable range.
- **RECOMMENDED ACTIONS:** Stormwater runoff impacted upstream reaches of White and Red Brooks as well as the lake itself. The increased frequency and intensity of storm events and the resulting stormwater runoff may be the cause of the worsening transparency trend. This highlights the importance of managing stormwater runoff in the watershed, particularly from paved, dirt, and gravel roads, driveways, rooftops, agricultural land, timber harvesting areas, and steep slopes. Identify areas of stormwater runoff in the watershed to implement stormwater best practices to capture and infiltrate stormwater before it reaches streams and the lake. DES has several resources available as well as the new Soak Up the Rain NH Program (www.soaknh.org). Work with local road agents to identify and manage stormwater runoff from roads and roadside ditches. Keep up the great work!

Dissolved Oxygen & Temp Profile Summer, 2014
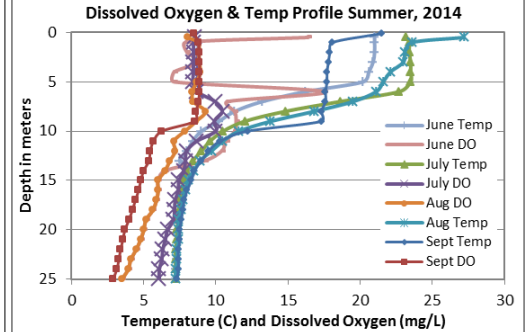
NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.

Chloride: > 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: between 6.5-8.0 (unless naturally occurring)

NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

Station Name	Table 2. 2014 Average Water Quality Data for Pleasant Lake, New London				
	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Turb. ntu	pH
PL 4 (White Bk.)	47.5		5	0.62	6.75
PL 4a	45.9		9	1.89	6.01
PL 4b	114.9		6	1.01	6.88
PL 4c	115.4		24	2.26	6.55
PL 5a	22.9		5	0.55	5.94
PL 7 (Red Bk.)	47.1	1	5	0.62	6.76
PL 7a	211.0		10	2.22	6.07
PL 7c	221.7		20	1.27	7.07
PL 7d	241.7		22	1.62	6.93
PL 8	51.1		5	1.31	6.79

Station Name	Table 1. 2014 Average Water Quality Data for Pleasant Lake, New London								
	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	E. Coli #/100ml	Total P ug/l	Trans. m		Turb. ntu	pH
						NVS	VS		
Epilimnion	5.4	4.01	47.1		5	5.78	6.16	1.09	6.83
Metalimnion			47.0		6			0.99	6.56
Hypolimnion			46.8		6			1.21	6.11
Chandler Brook			51.3		7			0.75	6.67
Outlet			47.5		5			0.66	6.72
Turtle Cove			47.4	0	5			0.56	6.83

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
Conductivity	Stable	Trend not significant; data show low variability.	Chlorophyll-a	Stable	Trend not significant; data highly variable.
pH (epilimnion)	Stable	Trend not significant; data highly variable.	Transparency	Worsening	Data significantly decreasing.
			Phosphorus (epilimnion)	Stable	Trend not significant; data moderately variable.

Historical Trend Epilimnetic Conductivity and pH

Historical Deep Spot Chlorophyll-a, Epilimnetic Total Phosphorus & Transparency Data